CLAIMS

What is claimed:

1. An installation process for treating biological liquid by viral inactivation, characterized in thatusing a treatment installation (1), it comprises

a main supply valve (4) for supplying biological liquid to treat, configured to be connected to at least one source (5) of biological liquid supply;

a first treatment line (2) downstream of said supply valve and provided with a first main treatment tank (7) configured to be supplied by said supply valve with biological liquid to treat;

a second treatment line (3) downstream of said supply valve and provided with a second main treatment tank (14) configured to be supplied by said supply valve with biological liquid to treat; said second treatment line being in parallel with said first treatment line; and

said second treatment line being in parallel with said first treatment line; and

a third main treatment tank (11) disposed at an outlet both from said first treatment line and from said second treatment line and which is configured to be successively supplied by said first main treatment tank and by said second main treatment tank;

said installation is configured such that in each of said first, second and third main treatment tanks, a determined volume of acid and a determined volume of base are introduced at least so as to adjust a pH of said biological liquid; and said installation is also configured to regulate a rate of drainage flow of said third main treatment tank so as to provide a continuous rate of flow of treated biological liquid at an outlet from said installation.,

2. An installation according to claim 1, characterized in that said first treatment line (2) is provided with a first intermediate treatment tank (9) disposed between said first and third main treatment tanks (7, 11).),

3. An installation according to claim 2, characterized in that it is configured in order for a determined volume of acid and for a determined volume of base to be introduced into said first intermediate treatment tank (9).

~~4. An installation according to claim 3, characterized in that it is configured in order for said biological liquid treated in said first main treatment tank (7) to be transferred into said first intermediate treatment tank (9) and incubates~~

~~for a predetermined time in the latter, before its transfer into said third main treatment tank (11).~~

~~5. An installation according to any one of claims 1 to 4, characterized in that~~ said second treatment line (3) is provided with a second intermediate treatment tank (16) disposed between said second and third main treatment tanks (14, 11)~~.~~,

said process comprising:

a step A of at least partial filling with biological liquid to treat of the first main treatment tank (7) of a first treatment line (2) of said installation via a main supply valve (4) of said installation;

a step B of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said first main treatment tank (7);

a step C of transferring said biological liquid from said first main treatment tank (7) to said first intermediate treatment tank (9);

a step D of incubating said biological liquid in said first treatment line (2) for a predetermined time and a step E of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said first treatment line (2) to approach a target pH;

a step F of transferring said treated biological liquid into a third main treatment tank (11) of said installation disposed at an outlet from said first treatment line (2), and a step G of pre-polishing by introducing a determined volume of acid and a determined volume of base into said third main treatment tank (11) to obtain a treated biological liquid at the target pH;

a step A' of at least partial filling with biological liquid to treat of a second main treatment tank (14) of a second treatment line (3) of said installation via said main supply valve (4), said second treatment line (3) being in parallel with said first treatment line (2);

a step B' of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said second main treatment tank (14);

a step C' of transferring said biological liquid from said second main treatment tank (14) to said second intermediate treatment tank (16);

a step D' of incubating said biological liquid in said second treatment line (3) for a predetermined time and a step E' of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said second treatment line (3) to approach a target pH;

a step F' of transferring said treated biological liquid into said third main treatment tank (11) also disposed at an outlet from said second treatment line (3), and a step G' of pre-polishing by introducing a determined volume of acid and a determined volume of base into said third main treatment tank (11) to obtain a treated biological liquid at the target pH;

at the same time as the steps of pre-polishing and/or of transferring and/or incubating and/or adjusting pH implemented in said second treatment line (3), a step of draining said third main treatment tank (11) by regulating a draining rate of flow so as to provide a continuous rate of flow of treated biological liquid at an outlet from said installation (1),

wherein the duration of the step A is the same as the duration of the steps B' to F', and the duration of the step A' is the same as the duration of the steps B to F.

~~6. An installation according to claim 5, characterized in that it is configured in order for a determined volume of acid and for a determined volume of base to be introduced into said second intermediate treatment tank (16).~~

~~7. An installation according to claim 6, characterized in that it is configured in order for said biological liquid treated in said second main treatment tank (14) to be transferred into said second intermediate treatment tank (16) and incubates for a predetermined time in the latter, before its transfer into said third main treatment tank (11).~~

~~8. An installation according to any one of claims 1 to 7, characterized in that it comprises a plurality of supply pumps (26, 31, 38, 43) disposed on said first and second treatment lines (2, 3), at least between said first main treatment tank (7) and said third main treatment tank (11), and possibly between said first main treatment tank (7) and said first intermediate treatment tank (9) and/or between said first intermediate treatment tank (9) and said third main treatment tank (11); and at least between said second main treatment tank (14) and said third main treatment tank (11), and possibly between said~~

second main treatment tank (14) and said second intermediate treatment tank (16) and/or between said second intermediate treatment tank (16) and said third main treatment tank (11).

9. An installation according to any one of claims 1 to 8, characterized in that said determined volumes of acid, and respectively said determined volumes of base, introduced at least into said first, second and third main treatment tanks (7, 14, 11), and possibly into said first and second intermediate treatment tanks (9, 16), depend on the physico-chemical properties of the biological liquid to treat and may be equal or different.

10. An installation according to any one of claims 1 to 9, characterized in that at least said first, second and third main treatment tanks (7, 14, 11), and possibly said first and second intermediate treatment tanks (9, 16), are

provided with a stirrer (71) for biological liquid and/or with one or more instrumentation units.

11. An installation according to any one of claims 1 to 10, characterized in that it comprises one or more control and command units (61, 62, 63) configured to control and command said supply valve (4) and/or at least one of said first, second and third main treatment tanks (7, 14, 11), and possibly to control and command said first and second intermediate treatment tanks (9, 16).

12. An installation according to any one of claims 1 to 11, characterized in that it comprises a single cart (69) on which are disposed at least said supply valve (4), said first, second and third main treatment tanks (7, 14, 11), and possibly said first and second intermediate treatment tanks (9, 16).

13. An installation according to any one of claims 1 to 12, characterized in that it is provided with disposable pipes linking different parts composing it, including at least said supply valve (4), said first, second and third main treatment tanks (7, 14, 11) and possibly said first and second intermediate treatment tanks (9, 16).

14. A process for treating biological liquid by viral inactivation, using a treatment installation (1) according to any one of the preceding claims, said process comprising:

a step of at least partial filling with biological liquid to treat of a first main treatment tank (7) of a first treatment line (2) of said installation via a main supply valve (4) of said installation;

a step of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said first main treatment tank (7);

a step of incubating said biological liquid in said first treatment line (2) for a predetermined time and a step of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said first treatment line (2) to approach a target pH;

a step of transferring said treated biological liquid into a third main treatment tank (11) of said installation disposed at an outlet from said first treatment line (2), and a step of pre-polishing by introducing a determined volume of

~~acid and a determined volume of base into said third main treatment tank (11) to obtain a treated biological liquid at the target pH;~~

~~at the same time as the steps of pre-polishing and/or transfer and/or incubation and/or adjustments of pH implemented in said first treatment line (2), a step of at least partial filling with biological liquid to treat of a second main treatment tank (14) of a second treatment line (3) of said installation via said main supply valve (4), said second treatment line (3) being in parallel with said first treatment line (2);~~

~~a step of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said second main treatment tank (14);~~

~~a step of incubating said biological liquid in said second treatment line (3) for a predetermined time and a step of adjusting pH of said biological liquid by introducing a determined volume of acid and a determined volume of base into said second treatment line (3) to approach a target pH;~~

~~a step of transferring said treated biological liquid into said third main treatment tank (11) also disposed at an outlet from said second treatment line (3), and a step of pre-polishing by introducing a determined volume of acid and a determined volume of base into said third main treatment tank (11) to obtain a treated biological liquid at the target pH;~~

~~at the same time as the steps of pre-polishing and/or of transferring and/or incubating and/or adjusting pH implemented in said second treatment line (3), a step of draining said third main treatment tank (11) by regulating a draining rate of flow so as to provide a continuous rate of flow of treated biological liquid at an outlet from said installation (1).~~

~~15~~2. A process according to claim ~~14~~ 1, characterized in that said first treatment line (2) is provided with ~~a~~ the first intermediate treatment tank (9) disposed between said first and third main treatment tanks (7, 11) and said second treatment line (3) is provided with ~~a~~ the second intermediate treatment tank (16) disposed between said second and third main treatment tanks (14, 11); and the process comprises a step of transferring said biological liquid from said first main treatment tank (7) to said first intermediate treatment tank (9) and the steps of incubating and adjusting pH to approach a target pH in said first treatment line (2) take place in said first intermediate treatment tank (9); as

well as a step of transferring said biological liquid from said second main treatment tank (14) to said second intermediate treatment tank (16) and the steps of incubating and adjusting pH to approach a target pH in said second treatment line (3) take place in said second intermediate treatment tank (16).